

REMARKS

Claims 1-29 and 49-51 were examined and rejected. Claims 30-37 and 38-48 have been previously canceled. Applicants amend no claims.

Applicants thank the Patent Office for the constructive Examiner Interviews of November 13, 2009 and December 10, 2009. During those interviews, it was discussed that the Examiner had brought to his supervisor's attention the fact that Harel discusses the problems of PVD imagers, such as difficult fabrication, increased cost, and safety problems noted in the third paragraph of page 18 and the third paragraph of page 24 of Harel (see also paras. 134 and 161 of corresponding US. Pub. 2005/0118527). However, the Examiner's supervisor preferred to maintain the current rejection because Harel also mentions that PVD imagers are more sensitive than particle-in-binder (PIB) imagers of Harel, as shown in Figure 13 of Harel. Applicants note that the sacrifice of sensitivity taught by Harel in order to overcome the problems noted above for PVD imagers does not erase the fact that Harel criticizes, discredits and otherwise discourages the PVD imagers as noted above, and in fact has a purpose and principle of using PIB technology to cure those problems (Depuy Spine, Inc. v Medtronic Sofamor Danek, Inc., (CFAC Docket 2008-1240, -1253, -1401, decided June 1, 2009, page 14-15 (also see MPEP 2141.02 and 2143.01))).

Applicants respectfully request reconsideration of claims 1-29 and 49-51, in view of at least the following remarks.

I. Claims Rejected Under 35 U.S.C. §103

The Patent Office rejects claims 1-29 and 49-51 under 35 U.S.C. § 103(a) as being obvious in view of WO 02/067014 to Harel et al. ("Harel") (see paragraphs of corresponding US. Pub. 2005/0118527). For a claim to be obvious every limitation of that claim must be taught by at least one properly combined reference.

Applicants respectfully disagree with the rejection above of claim 1, for at least the reason that the cited reference teaches against a photodetector comprising a first semiconductor layer consisting of a first semiconductor material; a second semiconductor layer consisting of a

second semiconductor material, the first and second semiconductor layers forming a heterojunction and being halides, as required by claim 1. According to claim 1, for example and without providing limitation thereto, both of the semiconductor layers are halides, form a heterojunction, and are semiconductor materials (excluding other elements that would affect the basic characterization of the layers as semiconductor materials, as opposed to, for example, the prior art layers that may contain particles of a semiconductor in a polymeric binder).

Harel teaches a photoconducting hybrid bi-layer detector plate 10 for an X-ray imaging system having a PIB layer consisting of a HgI₂ PIB composite 5 applied directly onto the PIB buffer layer 4 consisting of PbI₂ PIB composite 5 (see Harel, paras. 187-188 of corresponding US. Pub. 2005/0118527). However, this only teaches PIB layers (see Harel, paras. 134, 161, and 187-188 of corresponding US. Pub. 2005/0118527), but Harel does not teach a photodetector comprising semiconductor layers consisting semiconductor material that form the heterojunction and are halides, as required by claim 1.

Thus, to teach claim 1, the Patent Office relies upon substituting the PIB layers in Harel with a PVD material (see OA pg. 3 para. 4). However, the particles and binder layers of Harel cannot be substituted with a semiconductor layer consisting of a semiconductor material, as required by the claims because Harel teaches against such practice. As noted in the Remarks above and discussed during the Examiner Interview, Harel teaches against PVD deposited semiconductor, by criticizing, discrediting, or otherwise discouraging PVD semiconductor due to difficulty of fabrication, increased cost, and safety problems (see Harel, paras. 134 and 161 of corresponding US. Pub. 2005/0118527) (Depuy Spine, Inc. v Medtronic Sofamor Danek, Inc. (CFAC Docket 2008-1240, -1253, -1401, decided June 1, 2009, page 14-15 (also see MPEP 2141.02 and 2143.01))). Harel also teaches a primary purpose and principle of operation of using PIB layers to cure the problems of the PVD layer imagers noted above (see Harel, paras. 24, 21, 134, 161, and 187-188; and Figures 6 and 12-13 of corresponding US. Pub. 2005/0118527) (see MPEP § 2143.01 V and VI). Thus, Harel teaches against and cannot be properly combined with any technology or reference to teach the semiconductor layers consisting of semiconductor materials forming a heterojunction and being halides, as required by the limitations of claim 1. Moreover, aside from the fact that Harel teaches away from PVD layers, the mention of PVD imagers in Harel in no way teaches or suggest the specific layers and materials claimed by

applicant. Thus, applicant submits that even if Harel did not teach away, there has been no prima facie case of obviousness shown from the proposed combination.

Applicants further disagree with the rejection above for at least the reasons of record cited in the prior response.

Hence, for at least the reasons above, including the reason that Harel teaches against the limitations above of claim 1, Applicants respectfully request the Patent Office withdraw the rejection of claim 1 above.

Applicants disagree with the rejection above of independent claim 13 for at least the reason that the references do not teach or enable three semiconductor layers consisting of three semiconductor materials forming two heterojunctions; where the first and third material have a band gap of approximately 2.1eV; and where the second material has a band gap of approximately 2.3 eV and is thicker than the first and third materials, as required by claim 13. An argument analogous to the one above for claim 1 applies here as well to show that Harel does not teach the layers consisting of semiconductor material as required by claim 13.

In addition, Applicants disagree because Harel does not teach the third semiconductor layer consisting of a third semiconductor material, as required by claim 13. The Patent office cites Harel, para. 190 of corresponding US. Pub. 2005/0118527 against this limitation. However, this section of Harel only describes a PIB layer of PbI₂ above the PIB HgI₂. However, this only teaches PIB layers, but Harel does not teach the third semiconductor layer consisting of a third semiconductor material, as required by claim 13.

In addition, arguments corresponding to the one above for claim 1 apply to show that the particles and binder layers of Harel cannot be substituted with a semiconductor layer consisting of a semiconductor material, as required by claim 13 because Harel teaches against such practice.

Applicants disagree with the rejection above of independent claim 19 for at least the reason that the cited references do not teach or enable a first semiconductor layer consisting of a first semiconductor material; a second semiconductor layer consisting of a second semiconductor material, the first and second semiconductor layers forming a heterojunction and being halides, as required by claim 19. An argument analogous to the one above for claim 1 applies here as well.

Moreover, in addition to any arguments above, Applicants disagree that Harel would allow for the substitution of PVD semiconductor in place of the PIB layers to teach semiconductor layers consisting of semiconductor materials forming a heterojunction and being halides, that have the same bandgap or are less chemically reactive, as required by claims 2, 7, 13, 17 and 19. Instead, Harel teaches against such functionality by criticizing, discrediting or otherwise discouraging PVD semiconductor that are an example of materials the provide such functionality (see Depuy Spine) because those materials are difficult to fabricate, have increased costs, and have safety problems (see Harel, paras. 134 and 161 of corresponding US. Pub. 2005/0118527).

Next, in addition to any arguments above, Applicants disagree that Harel teaches that the second semiconductor material has a conductivity type different than the first semiconductor material, as required by claims 16, 19 and 49. Harel teaches PIB layers (see Harel, paras. 134, 161, and 187-188 of corresponding US. Pub. 2005/0118527). However, the Patent Office does not identify any teaching Harel of the PIB layers having different conductivity types, as required by claims 16, 19 and 49.

An argument similar to the one above that Harel does not teach the third semiconductor layer consisting of a third semiconductor material, as required by claim 13, applies to dependent claim 20.

Applicants have also provided an Expert Opinion in the Response mailed November 6, 2006 and including supporting documents mailed November 10, 2006 to attest to the fact that the particle-in-binder material is not the same as and has different functionality than the semiconductor layers consisting of semiconductor materials forming a heterojunction and being halides, of claim 1. Thus, Applicants assert that Harel teaches against using such layers, or using layers having an equivalent functionality, unless the Patent Office can show that the Expert Opinion is incorrect and that PIB material has the same functionality as the claimed layers.

Applicants submit that any dependent claims not mentioned above, being dependent upon allowable base claims, are patentable over the cited references for at least the reasons explained above as well as additional limitations of those dependent claims.

Thus, Applicants respectfully request that the Patent Office withdraw the rejection of all claims as being unpatentable over the cited references.

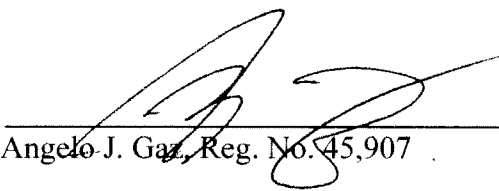
CONCLUSION

In view of the foregoing, it is believed that all claims now are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666.

Respectfully submitted,

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Dated: 2010-01-04

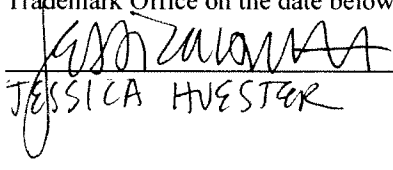


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